



Rotary Paddle Level Switch

INTRODUCTION

WORKING PRINCIPLE

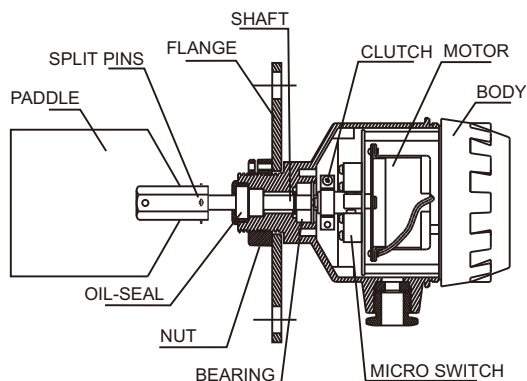
The purpose of the rotary paddle level switch is to detect the presence of solid/powdery material in most kinds of tanks, bins and containers.

The unit is usually located through a bin wall at the top, middle or low level of a bin. During normal operation (no material present) a synchronous motor rotates the paddle at RPM. When this paddle rotation is impeded by material, surrounding the paddle, motor will stall and cause the Micro-switch to change state (indicating an alarm or control).

APPLICATIONS

- Plastics and synthetics
- Chemicals and fertilizer
- Pharmaceuticals
- Food and beverage,
- Agriculture and fodder mills/depots
- Cement as well as ceramics
- Power plants
- Various incinerators

STRUCTURE



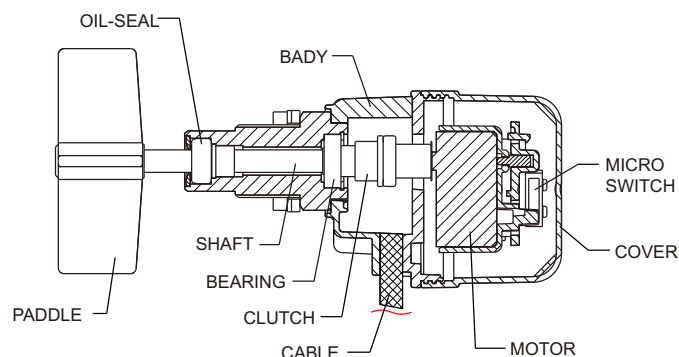
STANDARD TYPE SE1

FEATURES

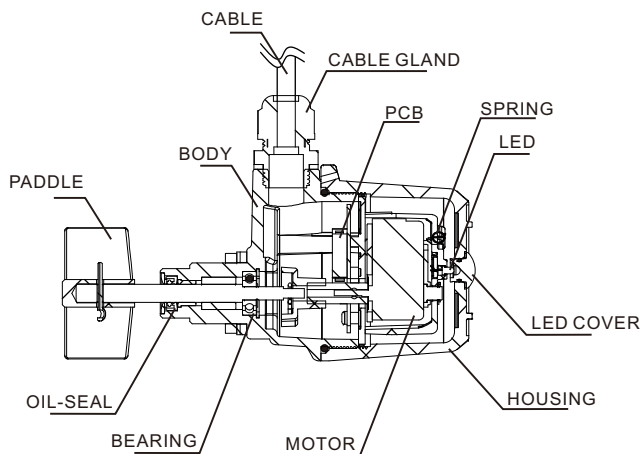
- Rugged sealing ring prevents dust from infiltrating the housing body along the shaft.
- Adjustable torque.
If the rotary paddle encounters overloading, the motor will automatically shut down the motor to prevent damage to the inner mechanisms and extend motor life.
- Very suitable for small tanks and low density materials
- Adjustable and extendible shaft models available
- A wide variety of paddles are available

BENEFITS

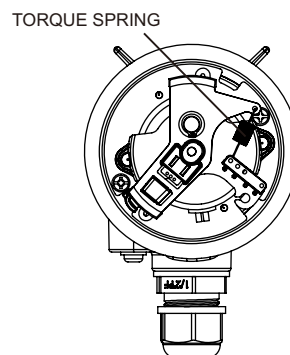
- Airtight sealed device.
- Outdoor and strenuous environment application
- Stable and reliable performance.
- Lightweight and easy to install
- Practically designed to allow maintenance, checks and replacement
- Not necessary to remove the complete set from the tank.



MINI TYPE SE2



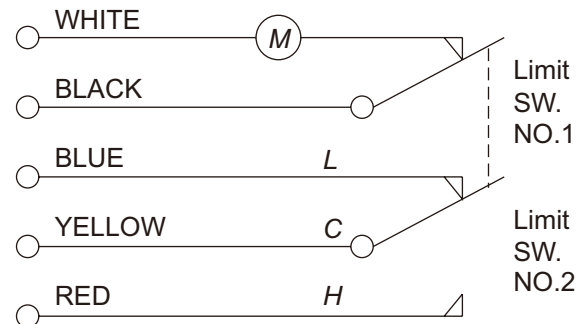
MINI TYPE SE3



WORKING PRINCIPLE & TORQUE ADJUSTING

CONTROL SWITCH WORKING PRINCIPLE

1. A synchronous turning motor indicates the tank or container's material isn't obstructing the paddles, C & L [COM & NC] are connected.
2. When the material is obstructing the paddles, C&L [COM & NC] are disconnected, C&H [COM & NO] are connected and the motor's current is cut off.
3. When the material drops away from the paddles and the motor starts again C & L [COM & NC] connect and the cycle has begun once again.



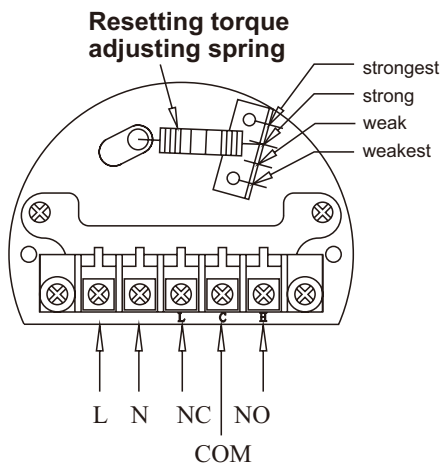
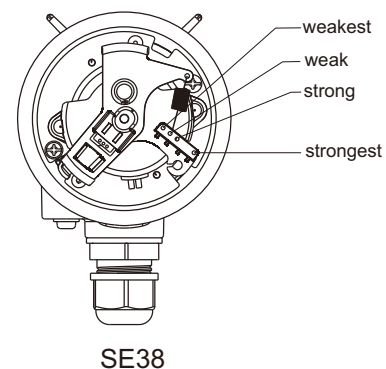
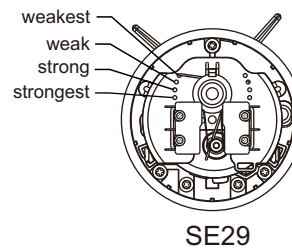
TORQUE ADJUSTING MECHANISM AND WIRING

The torque spring is applied to adjust the shaft output torque. Default settings are "weak" and can be adjusted to the customer's target based on the tank contents and S.G. (special gravity) of the material.

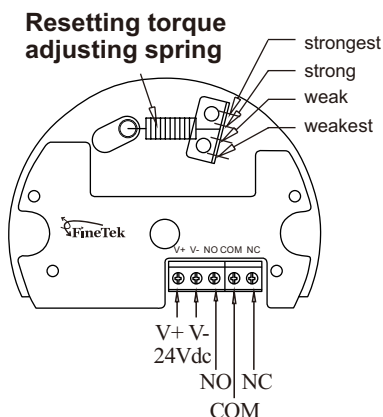
Higher S.G. materials require stronger torque settings. Start with high settings and slowly release the torque force until the appropriate setting is found.

- Do not tamper with the spring as it may cause the Rotary Paddle to malfunction.

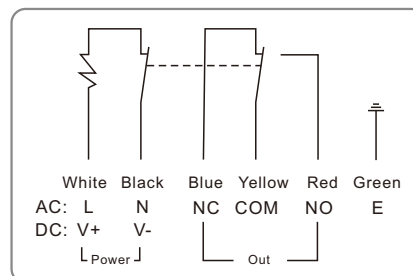
Spring adjusting hole



Available: SE1 (A,B,C,D)



Available: SE1(E)



Available: SE2/SE3

STANDARD TYPE

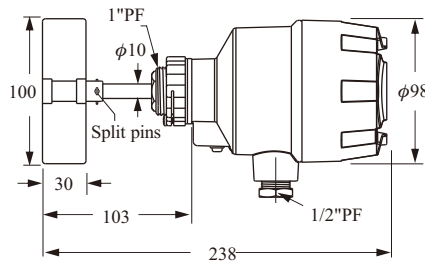
- **Power source** : (A)110Vac,(B)220Vac,(C)240Vac, (D)24Vac, 50/60Hz (E)24Vdc
- **Power consumption** : 3W, 11W(DC24V)
- **Contact capacity** : SPDT, 5A/250Vac
- **Rotary speed** : 1 R.P.M.
- **Insulation test voltage** : 2500V
- **Connection** : 1"PF screw or JIS 2-1/2" × 5kg²/cm flange
- **Protection/ material** : IP65 / ADC-12
- **Conduit** : 1/2"PF
- **Material density** : 0.5 g/cm³

SCREW TYPE

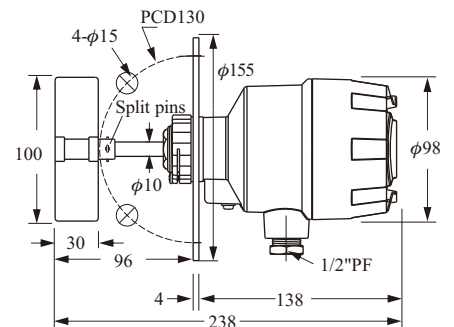
SE110 Series

- Horizontal mounting
- Operation Temperature (-20°C ~ 70°C)
- Weight: 1.2 kg

SE110 Series



SE111 Series



FLANGE TYPE

SE111Series

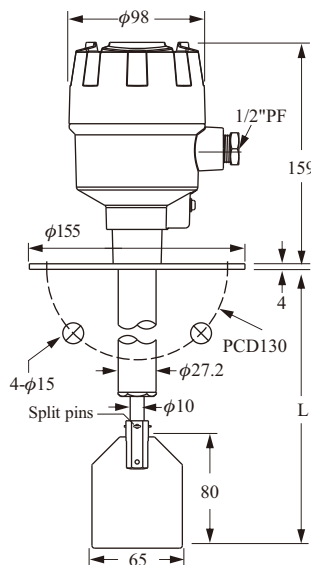
- Horizontal mounting
- Operation Temperature (-20°C ~ 70°C)
- Weight: 1.7 kg

SHAFT PROTECTIVE TUBE TYPE

SE120 Series

- Horizontal /Vertical mounting
- Operation Temperature (-20°C ~ 70°C)
- Weight: 1.2 kg
- Standard Length:
 - L--250mm (2.2 kg)
 - L--500mm (2.5 kg)
 - L--750mm (2.8 kg)
- Customized lengths available

SE120 Series

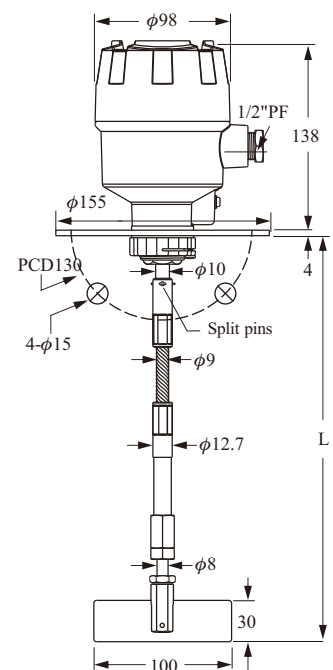


SE130 Series

SHAFT LENGTH ADJUSTABLE TYPE

SE130 Series

- Vertical mounting
- Operation Temperature (-20°C ~ 70°C)
- Standard Length:
 - L- 460~630mm (2.5 kg)
 - L- 650~1000mm (2.8 kg)
 - L- 760~1200mm (3.0 kg)
- Customized lengths available



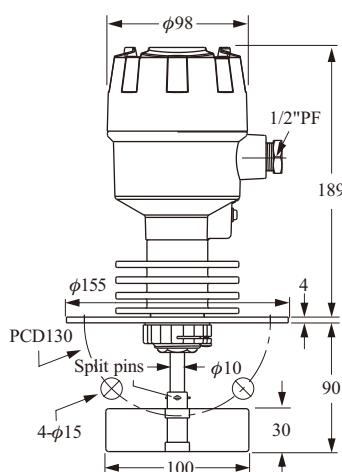
STANDARD TYPE

HI-TEMP TYPE

SE140 Series

- Horizontal mounting
- Temp. (-20°C ~ 200°C)
- Weight: 2.1 kg

SE140 Series



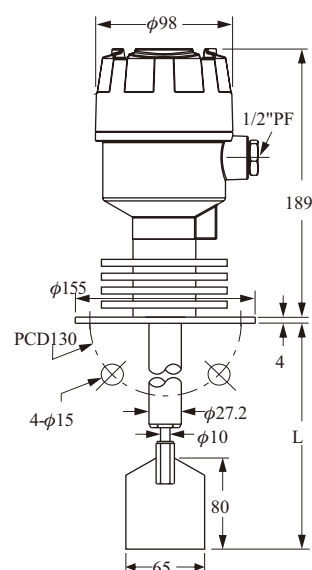
SE141 Series

HI-TEMP TYPE

PROTECTIVE TUBE TYPE

SE141 Series

- Horizontal /Vertical mounting
- Operation Temperature (-20°C ~ 200°C)
- Standard Length (option):
 - L--250mm (2.6 kg)
 - L--500mm (2.9 kg)
 - L--750mm (3.2 kg)
- Special length is made by order



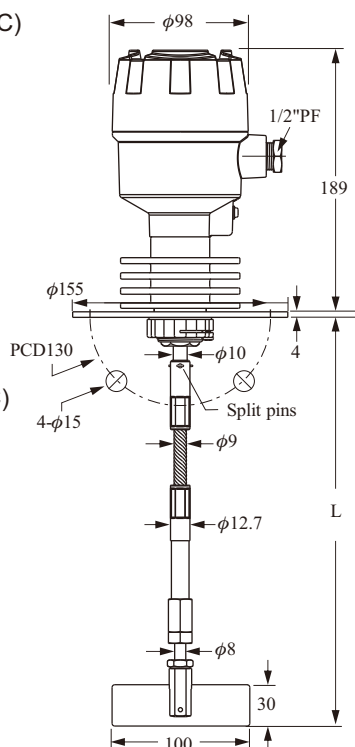
HI-TEMP SHAFT

LENGTH ADJUSTABLE TYPE

SE146 Series

- Vertical mounting
- Operation Temperature (-20°C ~ 200°C)
- Standard Length (option):
 - L- 450~630mm (3 kg)
 - L- 650~1000mm (3.3 kg)
 - L- 760~1200mm (3.5 kg)
- Special length is made by order

SE146 Series

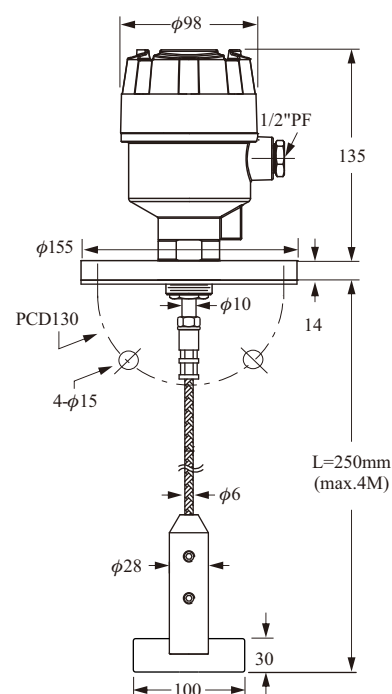


SE160 Series

CABLE WIRE TYPE

SE160 Series

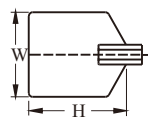
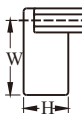
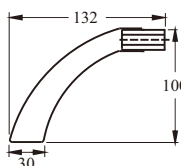
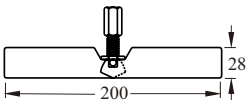
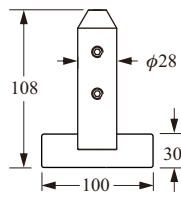
- Vertical mounting
- Operation Temperature (-20°C ~ 70°C)
- Standard Length (option):
 - L-- 450mm (2.5 kg)
 - L-- 650mm (2.8 kg)
 - L-- 750mm (3 kg)
- Special length is made by order



MODEL NUMBER / ORDER CODE COMPARISON TABLE

Model Number	Order Code
SE110	SEX10000-AA
SE111	
SE120	SEX10000-AB
SE130	SEX10000-AC
SE140	SEX10200-AA
SE141	SEX10200-AB
SE146	SEX10200-AC
SE160	SEX10000-AD

New / Old paddle model comparison table

New	Figure	Dimension(WxH)	Old
B		100x30	A
C		65x80	B
D		65x120	C
E		80x80	D
F		50x30	E
G		132x100	F
H		200x28	J
K		100x108	X

ORDER INFORMATION

SEX1 ⁰⁵ ⁰⁶ 0 0 - A ¹⁰ ¹¹ ¹² ¹³ ¹⁴ ¹⁵ ¹⁶ ¹⁷ ¹⁸ ¹⁹ ²⁰ ²¹ ²²

⁰⁵ ⁰⁶ Model

00: Standard
02: Hi-temperature

¹⁰ Construction

A: General type
B: Shafe protective tube type
C: Shafe length adjustable type
D: Cable wire type

¹¹ Power supply

A: AC110V D: AC24V
B: AC220V E: DC24V
C: AC240V

Connection

¹² ¹³

Flange item
AK: JIS-FF
AN: ANSI-RF
AS: DIN-FF
BC: Standard thin flange
(Suitable for 2-1/2"dimension)

Thread item
AA: JIS
AC: ANSI

¹⁴ ¹⁵

A8: 1"
B1: 1-1/2"
B2: 2"
B4: 2-1/2"

¹⁶ ¹⁷

01: PT male
03: PF male
07: NPT male
39: 5 kg/cm²x4T(Thin flange)
40: 5 kg/cm²
42: 10 kg/cm²
48: 150 Lbs
49: 300 Lbs
57: PN10
58: PN16

¹⁸ Paddle model

A: None
B: 100x30(WxH)
C: 65x80(WxH)
F: 50x30(WxH)

G: Scimitar type132x100(WxH)
H: Folding type 200x28(WxH)
K: 100x108(WxH)(Cable wire type only)

¹⁹ ²⁰ ²¹ ²² Length

Code	Length range
0001~4000	0001~4000mm

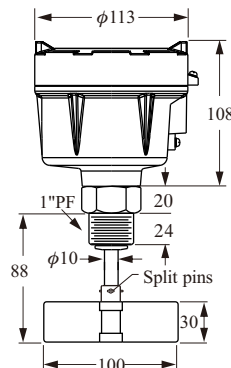
EXPLOSION PROOF TYPE

- **Power source** : (A)110Vac, (B)220Vac, (C)240Vac
(D)24Vac, 50/60Hz
- **Power consumption** : 3W
- **Contact capacity** : SPDT, 3A/250Vac
- **Rotary speed** : 1 R.P.M.
- **Insulation test voltage** : AC 1500V × 1minute

- **Connect** : 1"PF screw or flange 1"~6"
2-1/2" × 5kg/cm² (std.)
- **Housing material** : AL Alloy, ADC-12
- **Conduit** : 1/2" (std.) or 3/4"NPT
- **Material density** : 0.5 g/cm³

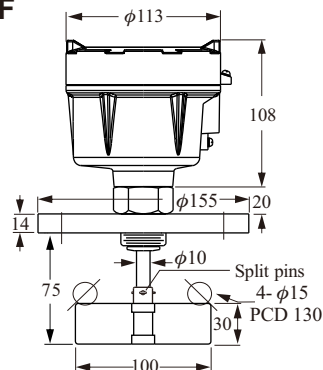
EXPLOSION PROOF CONNECTION TYPE SE170 series

- Horizontal mounting
- Temp. (-20°C ~ 70°C)



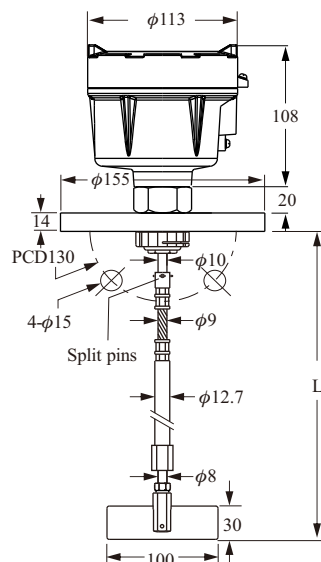
EXPLOSION PROOF FLANGE TYPE SE171 series

- Horizontal mounting
- Temp. (-20°C ~ 70°C)



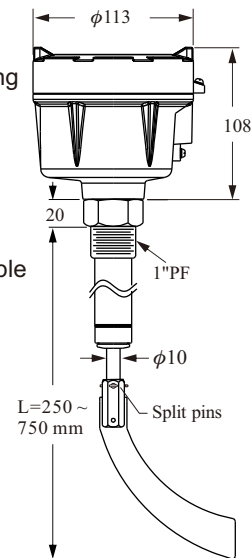
EXPLOSION PROOF ADJUSTABLE SHAFT TYPE SE173 series

- Vertical mounting
- Temp. (-20°C ~ 70°C)
- Standard Length (option):
L-- 450 ~ 630mm
L-- 650 ~ 1000mm
L-- 760 ~ 1200mm
- Special length is made by order



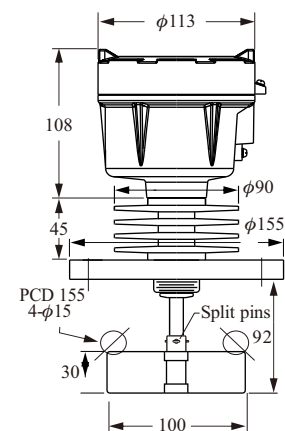
EXPLOSION PROOF SHAFT PROTECTION TYPE SE172 series

- Horizontal /Vertical mounting
- Temp. (-20°C ~ 70°C)
- Standard Length (option):
L-- 250mm
L-- 500mm
L-- 750mm
- Customized lengths available



EXPLOSION PROOF HI-TEMP TYPE SE174 series

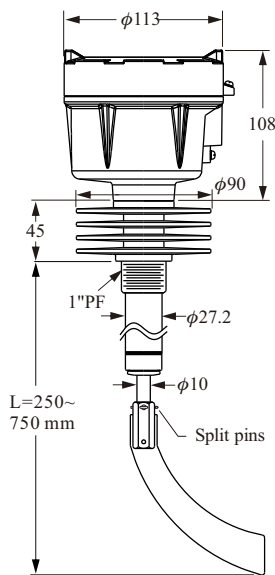
- Horizontal mounting
- Temp. (-20°C ~ 200°C)



EXPLOSION PROOF TYPE

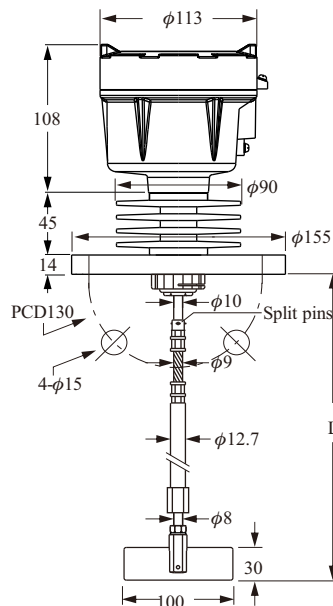
EXPLOSION PROOF HI-TEMP SHAFT PROTECTIVE TUBE TYPE SE175 Series

- Horizontal /Vertical mounting
- Temp. (-20°C ~ 200°C)
- Special length is made by order



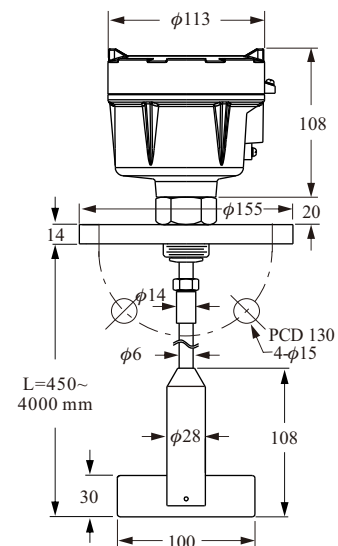
EXPLOSION PROOF HI-TEMP ADJUSTABLE SHAFT TYPE SE176 Series

- Vertical mounting
- Temp. (-20°C ~ 200°C)
- Special length is made by order

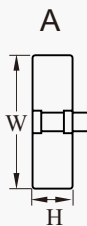


EXPLOSION PROOF CABLE WIRE TYPE SE177 Series

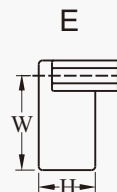
- Vertical mounting
- Temp. (-20°C ~ 70°C)
- Special length is made by order



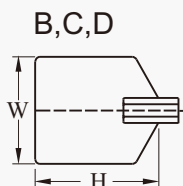
■ Paddle Introduction



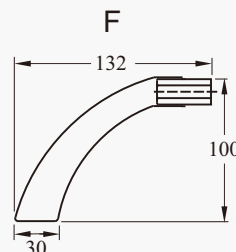
(A) 100x30 (WxH), Min. fixed hole diameter size $\phi 90$ mm.



(E) 50x30 (WxH), Suitable for high S.G. raw materials. Use a small size paddle to decrease the impact of material falling directly on paddle.



(B) 65x80 (WxH), Directly mounted into 2" fixed hole.
 (C) 65x120 (WxH), Directly mounted into 2" fixed hole.
 (D) 80x80 (WxH)

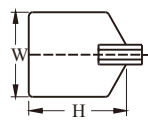
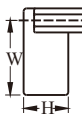
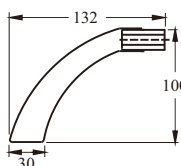
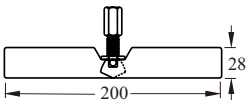
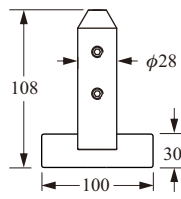


(F) Scimitar model paddle, Screw tightly on the 1" diameter fixed hole, It is easier to mount and dismount.

MODEL NUMBER / ORDER CODE COMPARISON TABLE

Model Number	Order Code
SE170	SEX300□□-AA
SE171	
SE172	SEX300□□-AB
SE173	SEX300□□-AC
SE174	SEX302□□-AA
SE175	SEX302□□-AB
SE176	SEX302□□-AC
SE177	SEX300□□-AD

New / Old paddle model comparison table

New	Figure	Dimension(WxH)	Old
B		100x30	A
C		65x80	B
D		65x120	C
E		80x80	D
F		50x30	E
G		132x100	F
H		200x28	J
K		100x108	X

ORDER INFORMATION

	05	06	07	08	10	11	12	13	14	15	16	17	18	19	20	21	22				
SEX3					-A																
05 06 Model																					
00: Standard																					
02: Hi-temperation																					
07 08 Certification																					
1C: ATEX-Exd																					
2C: IECEx-Exd																					
5C: TS-Exd																					
7C: NEPSI-Exd																					
10 Construction																					
A: General type																					
B: Safe protective tube type																					
C: Safe length adjustable type																					
D: Cable wire type																					
11 Power supply																					
A: AC110V																					
B: AC220V																					
C: AC240V																					
D: AC24V																					
Connection																					
12 13																					
Flange item																					
AK: JIS-FF																					
AN: ANSI-RF																					
AS: DIN-FF																					
14 15																					
A8: 1"																					
B1: 1-1/2"																					
B2: 2"																					
B4: 2-1/2"																					
16 17																					
01: PT male																					
03: PF male																					
07: NPT male																					
40: 5 kg/cm ²																					
42: 10 kg/cm ²																					
Thread item																					
AA: JIS																					
AC: ANSI																					
48: 150 Lbs																					
49: 300 Lbs																					
57: PN10																					
58: PN16																					
18 Paddle model																					
A: None																					
B: 100x30(WxH)																					
C: 65x80(WxH)																					
F: 50x30(WxH)																					
G: Scimitar type 132x100(WxH)																					
K: 100x108(WxH)(Cable wire type only)																					
19 20 21 22 Length																					
<table border="1"> <thead> <tr> <th>Code</th> <th>Length range</th> </tr> </thead> <tbody> <tr> <td>0001~4000</td> <td>0001~4000mm</td> </tr> </tbody> </table>	Code	Length range	0001~4000	0001~4000mm																	
Code	Length range																				
0001~4000	0001~4000mm																				

MINI TYPE(ALUMINUM ALLOY COVER)

Housing cover code:
0: Aluminum cover
1: Aluminum cover with LED lamp

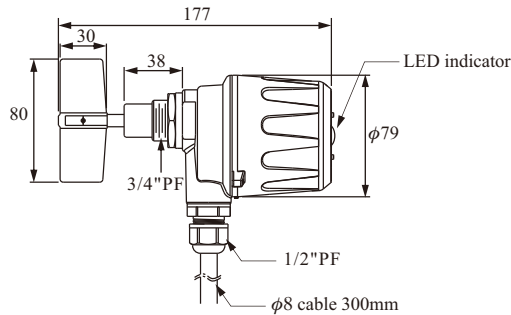
- **Power source** : (A)110Vac,(B)220Vac,(C)240Vac,
(D)24Vac, 50/60Hz,(E)24Vdc
- **Power consumption** : 1.5W
- **Contact capacity** : 5A/250Vac, 5A/30Vdc
- **Rotary speed** : 1R.P.M.
- **IP rating** : IP65

- **Housing material** : Aluminum alloy
- **Ambient temperature** : -40°C ~ 85°C
- **Cable length** : 300mm (available for custom length)
- **Material density** : 0.3 g/cm³
- **Display status** : Green(Working), Red(Stopped)

STANDARD TYPE

SE38□0 Series

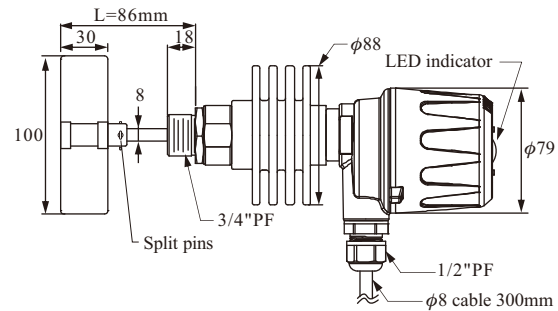
- Operation temperature: -40°C ~ 85°C
- Paddle material: PC



HIGH TEMPERATURE TYPE

SE38□4 Series

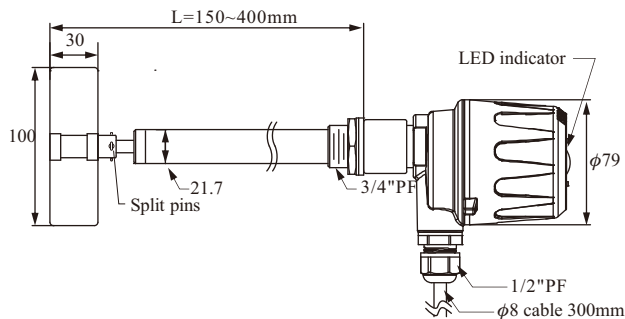
- Operation temperature: -40°C ~ 200°C
- Paddle material: SUS304



SHAFT PROTECTIVE TUBE TYPE

SE38□2 Series

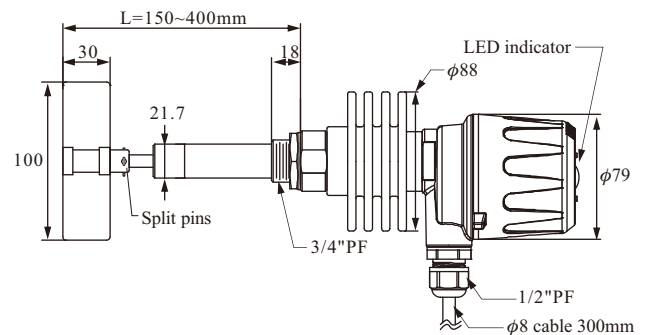
- Operation temperature: -40°C ~ 85°C
- Paddle material: SUS304



HIGH TEMPERATURE SHAFT PROTECTIVE TUBE TYPE

SE38□5 Series

- Operation temperature: -40°C ~ 200°C
- Paddle material: SUS304



MINI TYPE(EXPLOSION PROOF)

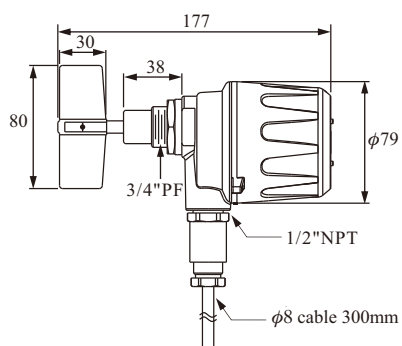
NEPSI DIP A20/21 T, T3~T6 IP65

- **Power source** : (A)110Vac,(B)220Vac,(C)240Vac,
(D)24Vac, 50/60Hz,(E)24Vdc
- **Power consumption** : 1.5W
- **Contact capacity** : 5A/250Vac, 5A/30Vdc
- **Rotary speed** : 1R.P.M.
- **IP rating** : IP65

- **Housing material** : Aluminum alloy
- **Ambient temperature** : -40°C ~ 85°C
- **Cable length** : 300mm (available for custom length)
- **Material density** : 0.3 g/cm³

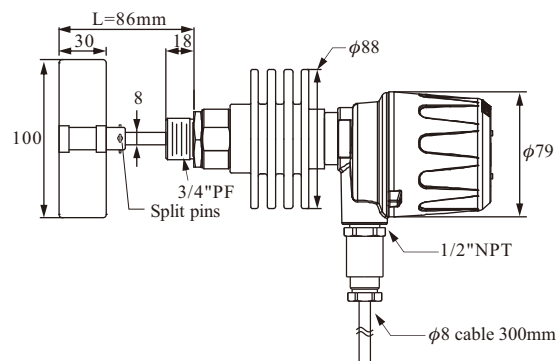
STANDARD TYPE SE3700 Series

- Operation temperature: -40°C ~ 85°C
- Paddle material: PC



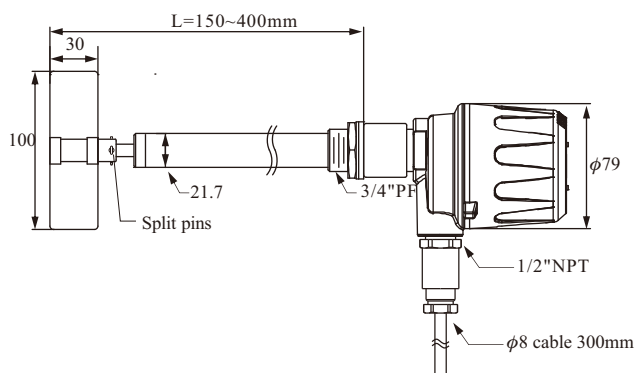
HIGH TEMPERATURE TYPE SE3704 Series

- Operation temperature: -40°C ~ 200°C
- Paddle material: SUS304



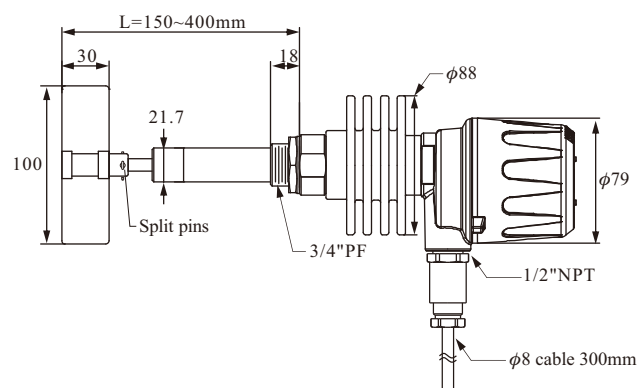
SHAFT PROTECTIVE TUBE TYPE SE3702 Series

- Operation temperature: -40°C ~ 85°C
- Paddle material: SUS304



HIGH TEMPERATURE SHAFT PROTECTIVE TUBE TYPE SE3705 Series

- Operation temperature: -40°C ~ 200°C
- Paddle material: SUS304



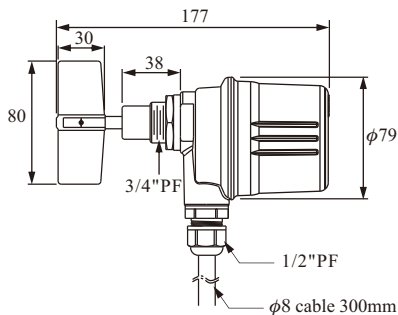
MINI TYPE(PLASTIC COVER)

- **Power source** : (A)110Vac,(B)220Vac,(C)240Vac,
(D)24Vac, 50/60Hz,(E)24Vdc
- **Power consumption** : 1.5W
- **Contact capacity** : 5A/250Vac, 5A/30Vdc
- **Rotary speed** : 1R.P.M.
- **IP rating** : IP65

- **Housing material** : Plastic cover
- **Ambient temperature** : -40°C ~ 85°C
- **Cable length** : 300mm (available for custom length)
- **Material density** : 0.3 g/cm³

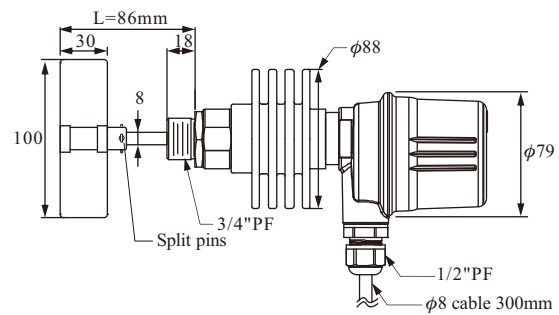
STANDARD TYPE SE3820 Series

- Operation temperature: -40°C ~ 85°C
- Paddle material: PC



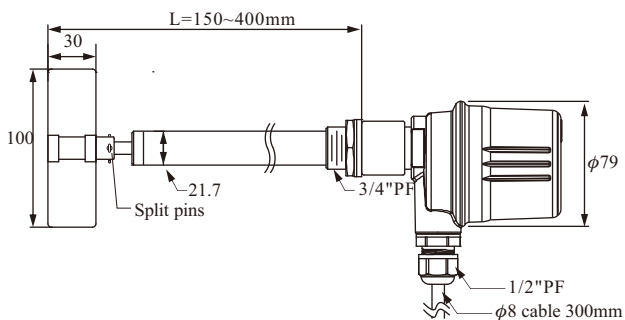
HIGH TEMPERATURE TYPE SE3824 Series

- Operation temperature: -40°C ~ 200°C
- Paddle material: SUS304



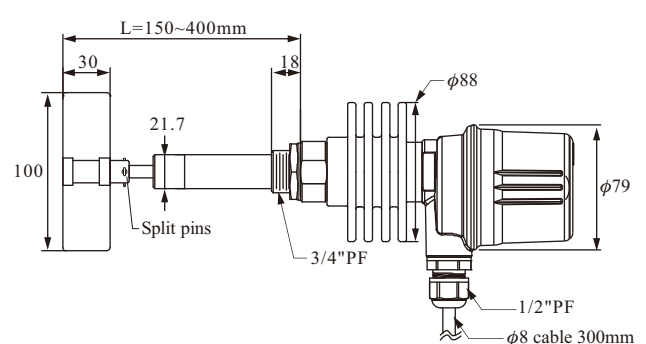
SHAFT PROTECTIVE TUBE TYPE SE3822 Series

- Operation temperature: -40°C ~ 85°C
- Paddle material: SUS304



HIGH TEMPERATURE SHAFT PROTECTIVE TUBE TYPE SE3825 Series

- Operation temperature: -40°C ~ 200°C
- Paddle material: SUS304

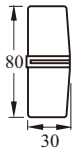
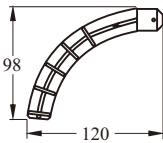
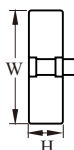
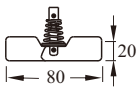


MODEL NUMBER / ORDER CODE COMPARISON TABLE

Model Number	Order Code
SE3700	SEX2007D-AA
SE3702	SEX2007D-AB
SE3704	SEX2027D-AA
SE3705	SEX2027D-AB
SE3800	SEX20000-AA
SE3810	SEX20000-BA
SE3820	SEX20000-CA
SE3802	SEX20000-AB

Model Number	Order Code
SE3812	SEX20000-BB
SE3822	SEX20000-CB
SE3804	SEX20200-AA
SE3814	SEX20200-BA
SE3824	SEX20200-CA
SE3805	SEX20200-AB
SE3815	SEX20200-BB
SE3825	SEX20200-CB

New / Old paddle model comparison table

New	Figure	Dimension(WxH)	Old
G		80x30	G
H		98x120	H
I		100x30	I
K		80x20	K

ORDER INFORMATION

	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
SEX2	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
05 06 Model																						
00: Standard																						
02: Hi-temperation																						
07 08 Certification																						
00: None																						
7D: NEPSI-Exd																						
(The housing select A:Alumium cover only)																						
09 Housing																						
A: Aluminum cover																						
B: Aluminum cover with LED lamp																						
C: Plastic cover																						
10 Construction																						
A: Ceneral type																						
B: Shafe protective tube type																						
11 Power supply																						
A: AC110V																						
B: AC220V																						
C: AC240V																						
D: AC24V																						
E: DC24V																						
Connection																						
12 13																						
Flange item																						
AK: JIS-FF																						
AN: ANSI-RF																						
AS: DIN-FF																						
14 15																						
A7: 3/4"																						
A8: 1"																						
B1: 1-1/2"																						
B2: 2"																						
16 17																						
01: PT male																						
03: PF male																						
07: NPT male																						
40: 5 kg/cm ²																						
42: 10 kg/cm ²																						
48: 150 Lbs																						
49: 300 Lbs																						
57: PN10																						
58: PN16																						

(Next page)

⑱ Paddle model

K: SUS; Folding type 80x20(WxH)

Code	Length range
0001~400	0001~400mm

Code	Length range
0300~5000	0300~5000mm

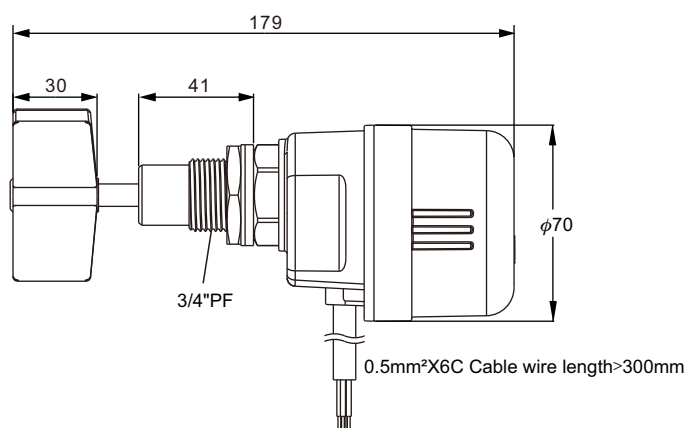
MINI TYPE(ECONOMY)

- **Power source** : (A)110Vac,(B)220Vac,
(D)24Vac, 50/60Hz
- **Power consumption** : 1.5W
- **Contact capacity** : 3A/250Vac, 3A/30Vdc
- **Rotary speed** : 1R.P.M.
- **IP rating** : IP65

- **Housing material** : Plastic cover
- **Ambient temperature** : -20°C ~ 80°C
- **Cable length** : 300mm (available for custom length)
- **Material density** : 0.3 g/cm³

STANDARD SE290 A/B/D

- Operation temperature: -20°C ~ 80°C
- Paddle material: PC



MODEL NUMBER / ORDER CODE COMPARISON TABLE

Model Number	Order Code
SE290A	SEX40000-CAA
SE290B	SEX40000-CAB
SE290C	SEX40000-CAC
SE290D	SEX40000-CAD

ORDER INFORMATION

SEX4 0 0 0 0 - CA 111213141516171819202122

⑪ Power supply

A: AC110V
B: AC220V
D: AC24V

Connection

⑫ ⑬

Flange item
AK: JIS-FF
AN: ANSI-RF
AS: DIN-FF

⑭ ⑮

A7: 3/4"
A8: 1"
B1: 1-1/2"
B2: 2"

⑯ ⑰

01: PT male
03: PF male
07: NPT male
40: 5 kg/cm²
42: 10 kg/cm²
48: 150 Lbs
49: 300 Lbs
57: PN10
58: PN16

⑱ Paddle model

A: None
G: PC; Cross type
H: PC; Scimitar type 120x98(WxH)
I: SUS; 100x30(WxH)
K: SUS; Folding type 80x20(WxH)

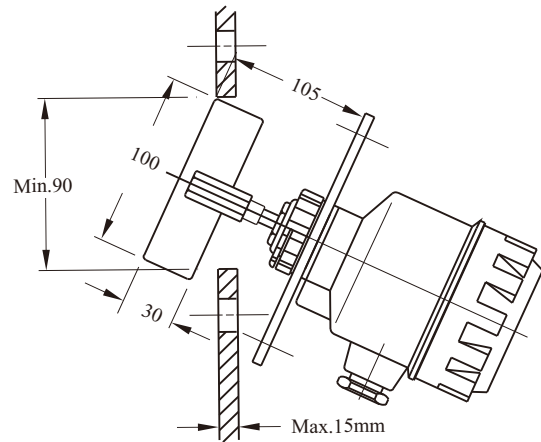
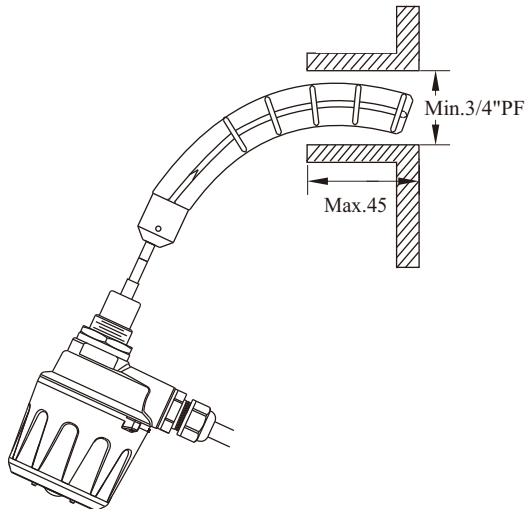
⑲ ⑳ ㉑ ㉒ Cable wire length

Code	Length range
0300~5000	0300~5000mm

MOUNTING EXAMPLES

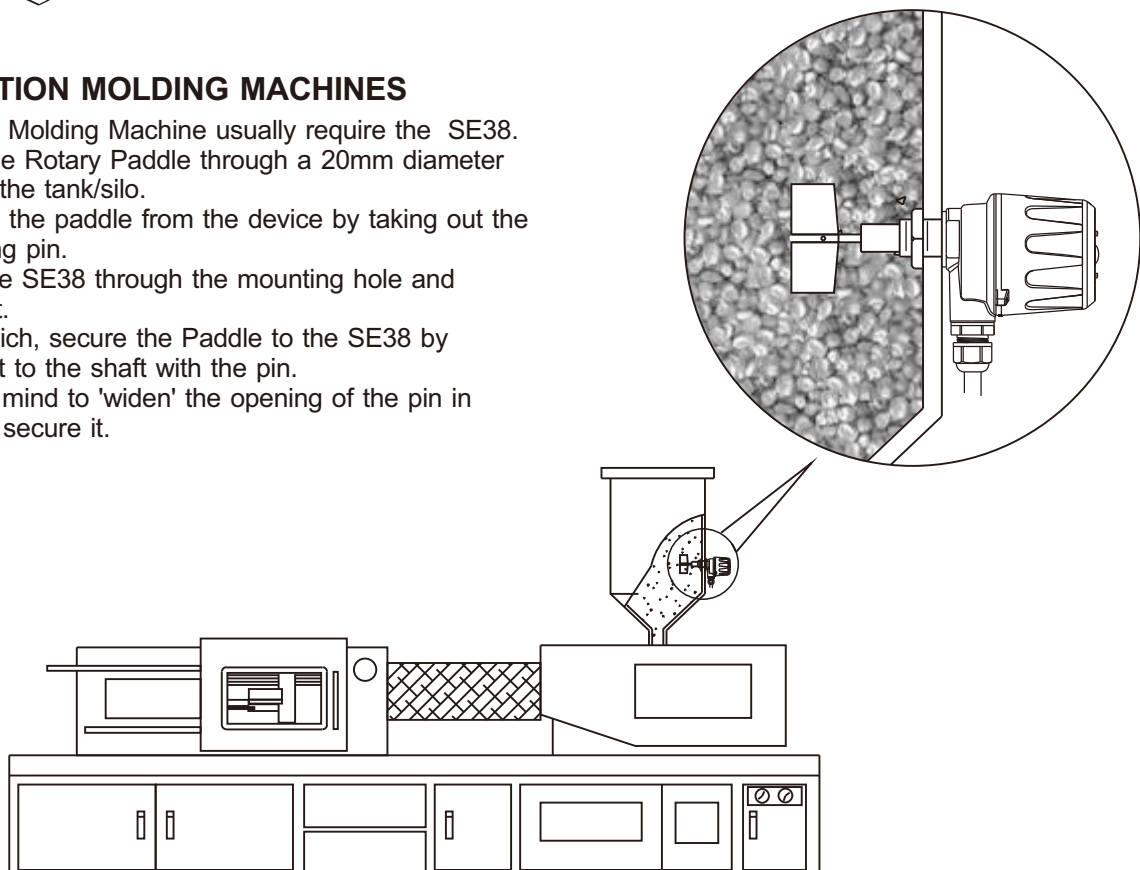
Regular models such as the SE11 should be installed directly on the tank side.
Mount at a 35° angle the blade through the tank opening or hole sliding the blade in first.

* The SE170 series minimum hole size should be 95mm in diameter.
The scimitar model is directly installed on the tank wall method as shown below.
(Assuming an arc-shaped tank with a 3/4" connection) and then screwing it tight.

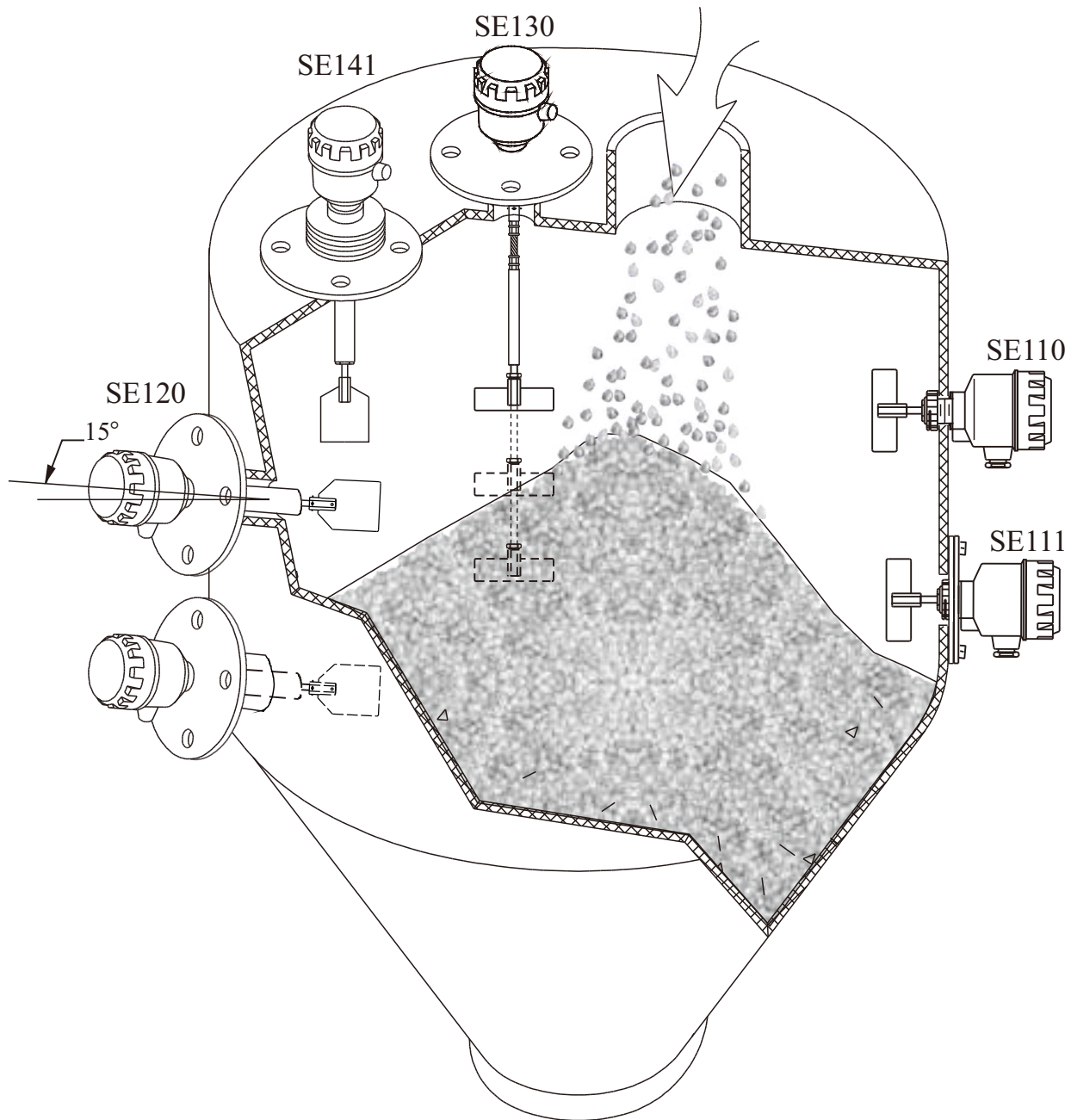


INJECTION MOLDING MACHINES

Injection Molding Machine usually require the SE38.
Install the Rotary Paddle through a 20mm diameter hole on the tank/silo.
Remove the paddle from the device by taking out the fastening pin.
Insert the SE38 through the mounting hole and tighten it.
After which, secure the Paddle to the SE38 by locking it to the shaft with the pin.
Keep in mind to 'widen' the opening of the pin in order to secure it.



EXAMPLES



INSTALLATION NOTICES

1. Side mount the sensor at a downward angle of 15° ~ 20° to decrease the material inflow impact.
2. For high temperature application (more than 70°C), please use the SE14□ Series.
3. For SE110~SE140 using a 1" inlet, please apply the scimitar model and screw directly.
4. For SE130, SE146 series have flexible and extendible shafts.
5. Please ensure the lead wire enters the housing from the bottom and the nuts are fastened to secure the device.